Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Amendment of Parts 15 and 90 of the Commission's Rules to Provide Additional Frequencies For Cordless Telephones	)))))	ET Docket No. 93-235

COMMENTS OF ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC. AND PUBLIC BROADCASTING SERVICE

The Association for Maximum Service Television, Inc. ("MSTV") and the Public Broadcasting Service ("PBS") hereby file comments in response to the Notice of Proposed Rulemaking, ET Docket No. 93-235, released in the above captioned docket on September 17, 1993 ("Notice").[1/]

The proposed cordless telephone base station operations are to be located in the 43-44 MHz and 48-49 MHz bands. The lower frequencies fall in the 41-47 MHz band, which serves as the intermediate frequency ("IF") band in television receivers. All television receivers process incoming signals on these frequencies, regardless of whether the signal originates off-air or by cable, or from home consumer electronics devices such as VCR's and laser disc

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1/ MSTV is a trade association of approximately 250 local broadcast television stations committed to achieving the highest technical quality feasible for the local broadcast system. PBS is a private, non-profit corporation whose members include virtually all of the nation's public television stations. PBS's primary function is to distribute television programming produced by public television stations and other independent production entities.

players. As the Commission is aware, the IF is extremely sensitive to co-channel interference.

MSTV and PBS believe that the proposed allocation of the 43-44 MHz band for cordless telephone operation will result in harmful interference to television reception because consumers will often operate cordless telephone base stations in close proximity to home television receivers. The Commission should therefore consider alternative spectrum for cordless telephones if additional channels are needed. This view is supported by the Zenith Corporation, one of the nation's largest manufacturers of television receivers, which agrees with MSTV and PBS that use of the 43-44 MHz band for cordless telephone operation does not appear feasible.[2/]

In the event that the Commission nevertheless allocates the 43-44 MHz band to cordless telephone operation, the Commission at the very least should require manufacturers of cordless telephones to print a clearly visible warning on the packaging of such devices which explains that use of the device may cause interference to the operation of nearby television receivers. While this is a far from satisfactory alternative, given the magnitude of the interference problem, a clear consensus among the commenters in the affected industries agree that it is essential. In addition, the Commission should require persons operating cordless

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[2/] See Comments of Zenith Corp., ET Docket No. 93-235, at 1-4 (Nov. 8, 1993).

telephones to resolve any interference problems that result from the use of such devices, or to cease using the devices when interference results to their neighbors.

I. The Operation of Cordless Telephones In the Proposed Bands Will Interfere With the Operation of Television Receivers.

This proceeding is the latest of a long series of cordless telephone spectrum initiatives.[3/] As with some of those past efforts, however, the specific proposal in the instant proceeding raises problems of interference with television reception. See, e.g., Reply Comments of MSTV, Gen. Docket No. 83-325 (June 3, 1983).

Under the current rules, individuals may operate cordless telephones as secondary users on ten channels located in the 46 and 49 MHz bands. See 47 C.F.R. § 15.233 (1993). The Commission now proposes to add fifteen new duplex channels in the 43-44 and 48-49 MHz bands. Notice, ¶ 10. The proposed channels in the 43-44 MHz band are squarely within the IF of television receivers.

A television receiver, as part of the amplification of the broadcast signal, downconverts the signal to the IF

[3/] See, e.g., Petition of the TIA (August 20, 1992) (seeking allocations in the 43-44 and 48-49 MHz band); Petition of the Personal Communication Section of the TIA (April 30, 1990) (seeking allocations in the 46 and 49 MHz bands); In the Matter of Amendment of the Commission's Rules to Establish New Personal Communications Services, 5 FCC Rcd 3995, 4000 n.13 (1990) (seeking allocations in the 46 and 49 MHz band); In the Matter of a Spectrum Allocation for Cordless Telephones in the 800/900 MHz Band, 2 FCC Rcd 7278 (1987) (denying EIA request for allocations in the 800/900 MHz band) ("Spectrum Allocation").

band; almost all of the amplification and much of the signal processing then occurs in the IF band. Every current NTSC television receiver must convert the incoming signal through the IF, and this holds true regardless of whether a viewer receives a signal off-the-air or by cable. Thus, if there is direct interference to the IF, a television receiver will not be able to process the incoming signal properly. RF interference caused by a cordless telephone base station is co-channel interference which can and will impair the operation of a television set,[4/] a problem acknowledged even by the proponents of the 43-44 MHz band allocation.[5/]

To be sure, the radius of interference from the cordless telephone base station is not enormous: approximately 3 meters. However, many consumers operate their cordless telephone base station within a few feet of their television set. Moreover, consumers are notoriously incapable of isolating interference sources and, in any event, many telephones in apartment buildings and condominiums are within nine feet of a neighbor's receiver or another cordless telephone. In many of these instances, it will not be possible for the consumer to relocate the cordless telephone to a non-interfering location. The result will be yet another

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4/ See Attached Engineering Statement of Jules Cohen, P.E.

5/ See Comments of CEG/EIA, ET Docket No. 93-235, at 2 (Nov. 8, 1993); Comments of TIA, ET Docket No. 93-235, at 4 (Nov. 8, 1993); Comments of Thomson Consumer Electronics Inc., ET Docket No. 93-235, at 2-3 (Nov. 8, 1993).

of the literally dozens of different sources of interference which are causing the "AM-ization" of television.[6/]

Of perhaps even greater concern is the possible effect of cordless telephone base stations located in the 43-44 MHz band on future Advanced Television ("ATV") receivers. Although not yet certain, at this time it seems probable that ATV receivers will use the current NTSC IF, and will be equally susceptible to interference from cordless telephone base stations on existing NTSC receivers. See Attached Engineering Statement of Jules Cohen, P.E., at 2; see generally "Advisory Group Selects MPEG-2, Dolby, and Mixed Scanning Format for HDTV," Communications Daily, October 25, 1993, at 2 (noting that transmission system still not determined); In the Matter of Waiver of Part 15 of the Commission's Rules, 8 FCC Rcd 2730, 2730-31 (1993) (refusing to license a two-way radio system because of its potential interference to development and operation of ATV systems). Moreover, MSTV and PBS are not alone in their concern for preserving the integrity of television receiver operation in the long term -- the Zenith Corporation also believes that the proposed 43-44 MHz allocation will create a continuing interference problem. See Comments of Zenith Corp., ET Docket No. 93-235, at 3-4 (Nov. 8, 1993). Simply put, the problem of

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[6/] See, e.g., MSTV Petition for Inquiry (October 4, 1989) (cataloguing the numerous sources of licensed interference to television and asking for comprehensive FCC oversight and assessment of television interference); see also Reply Comments of MST, Gen. Docket No. 83-325 (June 3, 1983).

base station interference is not going to go away with the advent of ATV.

Moreover, the fact that the ATV signal will be digital cannot be relied upon to protect it from the effects of this interference. At low levels of such interference the digital signal may show no effects and perform better than current analog NTSC service. However, at higher levels of interference the digital signal reception may be completely destroyed. MSTV and PBS submit that given the continuing nature of the interference problem, it simply is not prudent to allocate frequencies within the IF band for cordless telephones.

II. If the Commission Allocates Spectrum in the IF Band to Cordless Telephones, It Should Establish Labelling Requirements Warning Consumers of the Potential For Interference and Also Require Cordless Telephone Users To Resolve Any Interference Problems.

The only way to avoid completely the interference problem created by the operation of cordless telephones on frequencies within the IF band is to allocate frequencies outside the IF band for cordless telephones. See, e.g., Spectrum Allocation, 2 FCC Rcd at 7278 (reporting EIA's request for spectrum allocations in the 800/900 MHz bands). Should the Commission persist with the proposed allocation, it should take steps to mitigate the impact on television reception by requiring labels on cordless telephones warning consumers as to the danger to television reception and

instructing them as to methods by which to alleviate it.[7/] The Commission has established analogous labelling requirements, both for cellular telephones, see 47 C.F.R. §§ 15.19, 15.223(c) (1993), and other devices, see 47 C.F.R. § 15.105(a) & (b) (requiring warning notices in the operations manuals for digital devices, including certain computers); 47 C.F.R. § 18.213 (requiring warning labels on certain ISM equipment). In fact, even the most ardent supporters of the proposed spectrum allocation endorse the use of mandatory warnings to consumers regarding the interference problem between cordless telephone base stations and television receivers. See, e.g., Comments of CEG/EIA, ET Docket No. 93-235, at 2 (Nov. 8, 1993); Comments of TIA, ET Docket No. 93-235, at 4 (Nov. 8, 1993).

In addition, the Commission should make it clear, both by rule and by notice in the same warning labels, that cordless telephone operators are responsible for ensuring that use of the device does not create interference to the operation of their neighbors' television receivers and, if it does, that they must cease using the device.[8/] See, e.g., 47 C.F.R. §§ 15.19, 15.223(c), 18.213.

[7/] For example, such warnings could state: "Warning: Operation of this Cordless Telephone May Cause Interference to the Operation of Television Sets. Do Not Operate Base Station Within 3 Meters of Any Television Set."

[8/] I.e., the Commission should prohibit the operation of a cordless telephone in a location that causes interference to the reception of another person's television receiver.

CONCLUSION

When receiver manufacturers standardized the use of the 41-47 MHz IF band on the recommendation of the Commission in the 1950s, it was believed that the band would be protected from interfering signals. Ideally, the Commission should allocate spectrum outside the IF band for cordless telephones. However, if the Commission ultimately decides to authorize additional channels located within the IF for cordless telephones, the Commission should adopt rules that will require manufacturers to alert consumers about the potential interference that cordless telephones may cause to television receivers, and require consumers to stop using the devices

after receipt of a complaint regarding interference to television reception.

Respectfully submitted,

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ORIGINAL

ENGINEERING STATEMENT ON BEHALF OF THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC. ET DOCKET NO. 93-235

This engineering statement has been prepared on behalf of the Association for Maximum Service Television, Inc. ("MSTV") in support of comments to the Notice of Proposed Rulemaking, ET Docket No. 93-235 ("Notice"). That Notice proposes the allotment of channels in the 43-44 MHz and 48-49 MHz bands for use by cordless telephone base stations.

As acknowledged in the Notice, channels in the 43-44 MHz band fall within the intermediate frequencies (IF) passband of television receivers. (¶ 11 and footnote 10) Consequently, use of those channels constitutes a potential threat of interference to television reception. Since all television channels, whether VHF or UHF, and whether received off-air or via cable, are down-converted in frequency to the 41-47 MHz IF band, the threat is universal and not channel specific.

Interference can be caused either by pickup of the signal by indoor antennas, then passed through the mixer stage of the tuner to the IF amplifier, or by direct pickup within the IF stage. In either instance, if the signal is sufficiently strong, either video or audio, or both can be affected.

Part 15 requires that the radiated signal strength from a cordless telephone base station be no more than 10 mV/m (80 dBμ) at three meters. A signal of that strength would certainly be expected to be sufficient to cause noticeable impairment of television reception. The sensitivity of receivers to interference from signals in the IF band is variable carrying the expectation that some receivers may suffer interference at distances greater than three meters (9.8 feet).

Although the expectation is that most interference would be expected to be caused to receivers in the same home as the cordless telephone base station, that may not be true in the case of multi-family dwellings. In such instances, the cordless telephone base station in one apartment and the television receiver in an adjacent apartment may be separated by little more than the thickness of a wall, floor or ceiling.

Broadcasters and the viewing public are looking forward to the advent of high definition television (HDTV). Although HDTV receivers are expected to be of the double-tuned variety with a first IF at a band location different from that currently used, the second IF is expected to be the same as at present, *i.e.*, 41-47 MHz. HDTV receivers are likely to be as vulnerable as NTSC receivers to interference from cordless telephone base station operation in the 43-44 MHz band.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on November 5, 1993.

Jules Cohen, P.E.